

WHAT IS CLAIMED:

1. A filtering device for capturing embolic material released into a body vessel during a therapeutic interventional procedure, comprising:

5 a guide wire having a proximal end and a distal end and adapted to be inserted within the vasculature of a patient and maneuvered to a point distal to an interventional procedure site;

an expandable cage assembly having distal and proximal ends, the cage assembly being attached to the distal end of the guide wire and expandable to capture embolic material and collapsible to retain the captured embolic material;

10 filter material secured to the expandable cage assembly; and

at least one hinge located on the guide wire to allow the expandable cage assembly to freely articulate on the guidewire.

2. The filtering device of claim 1, wherein:

15 the guide wire does not pass through the expandable cage assembly and comprises separate sections, one section attached to and extending from the proximal end of the expandable cage assembly and one section attached to and extending from the distal end of the expandable cage assembly.

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3. The filtering device of claim 1, wherein:

a hinge is located distal the distal end of the expandable cage assembly.

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4. The filtering device of claim 1, wherein:

a hinge is located proximal the proximal end of the expandable cage assembly.

5. The filtering device of claim 1, wherein:
each hinge comprises notches cut along the longitudinal axis of the
guide wire such that an area of decreased guidewire diameter is created.

5 6. The filtering device of claim 1, wherein:
each hinge comprises slots cut in the guide wire, each slot extending
along the longitudinal axis.

7. The filtering device of claim 1, wherein:
10 each hinge comprises slots cut in the guide wire, each slot extending
perpendicular to the longitudinal axis.

8. The filtering device of claim 1, wherein:
each hinge comprises holes cut in the guide wire along the
15 longitudinal axis.

9. The filtering device of claim 1, wherein:
each hinge comprises a spring connecting separate sections of the
guide wire.

20 10. The filtering device of claim 1, wherein:
each hinge comprises a portion of material having a different
durometer than the guide wire, the portion of material connecting separate sections
of the guide wire.

25 11. The filtering device of claim 1, wherein:
the expandable cage assembly is generally tubular-shaped.

30 12. The filtering device of claim 1, wherein:
the filter material is generally parabolic-shaped.

13. The filtering device of claim 1, wherein:
the filter material further comprises a plurality of openings therein.
14. The filtering device of claim 1, wherein:
5 the guide wire further comprises a coiled tip at the distal end.
15. The filtering device of claim 1, wherein:
the expandable cage assembly further comprises a plurality of struts
adapted to be expanded from an unexpanded condition, the filter material attached
10 to the plurality of struts.
16. The filtering device of claim 15, wherein:
each of the plurality of struts further comprises a radioopaque marker.
- 15 17. The filtering device of claim 15, wherein:
each the struts is comprised of a radioopaque material.
18. The filtering device of claim 15, wherein:
the expandable cage assembly is relatively flexible at the distal end
20 and relatively stiff at the proximal end.
19. The filtering device of claim 1, further comprising:
stop fittings attached to the guide wire at the proximal and distal ends
of the expandable cage assembly, the stop fittings preventing the expandable cage
25 assembly from moving proximally or distally along the guide wire.
20. The filtering device of claim 19, further comprising:
a stop fitting attached to the guide wire distal to the proximal end of
the expandable cage assembly.

21. The filtering device of claim 20, wherein:

the stop fittings are conical-shaped and provide a smooth transition between the expandable cage assembly and guide wire.

5 22. A system for facilitating the capture of embolic material released into a body vessel during a therapeutic interventional procedure, comprising:

a filtering device comprising a guide wire having proximal and distal ends, an expandable cage assembly having proximal and distal ends, the cage assembly being attached to the distal end of the guide wire and expandable to capture embolic material and collapsible to retain the captured embolic material, filter material secured to the expandable cage assembly, and at least one hinge; and

a delivery sheath having an elongated shaft, a distal end, and a proximal end, wherein the sheath is adapted to maintain the expandable cage assembly in a collapsed condition.

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23. The system of claim 22, further comprising:

an obturator having a distal end and proximal end, wherein the obturator is attached to the guide wire distal end such that the obturator proximal end lies distal the distal end of the expandable cage assembly and the obturator distal end covers a portion of the guide wire distal end.

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24. The system of claim 23, wherein:

the obturator proximal end has essentially the same outer diameter as the delivery sheath and the obturator distal end converges to an outer diameter slightly larger than the outer diameter of the guide wire, and wherein the obturator proximal end forms a smooth profile with the delivery sheath distal end when the filtering device is retained in the delivery sheath.

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25. The system of claim 23, wherein:
the obturator further comprises a hinge allowing the obturator to
freely articulate on the guide wire.